

What is claimed:

1        1. A compound comprising: **(a)** a hormone domain selected from the group  
2 consisting of gonadotropin-releasing hormone, l-LHRH-III, bLH, estrogen, testosterone,  
3 luteinizing hormone, chorionic gonadotropin, follicle stimulating hormone, melanocyte-  
4 stimulating hormone, estradiol, dopamine, somatostatin, and analogues of these  
5 hormones; and **(b)** a lytic peptide domain.

1        2. A compound as recited in Claim 1, wherein said hormone domain is  
2 bonded directly to said lytic peptide domain, without an intermediate linking domain  
3 joining said hormone domain to said lytic peptide domain.

1        3. A compound as recited in Claim 1, wherein said lytic peptide domain is  
2 selected from the group consisting of a cecropin peptide, a melittin peptide, a defensin  
3 peptide, a magainin peptide, a sarcotoxin peptide, and analogs of said peptides.

1        4. A compound as recited in Claim 1, wherein said lytic peptide domain  
2 comprises hecate.

1        5. A compound as recited in Claim 1, wherein said hormone domain  
2 comprises l-LHRH-III.

1        6. A compound as recited in Claim 1, wherein said hormone domain  
2 comprises gonadotropin-releasing hormone.

1        7. A compound as recited in Claim 1, wherein said compound has the  
2 sequence SEQ. ID NO. 3 or SEQ. ID NO. 4.

1       **8.**     A compound as recited in Claim 1, wherein said compound has the  
2 sequence SEQ. ID NO. 12 or SEQ. ID NO. 15.

1       **9.**     A compound as recited in Claim 1, wherein said hormone domain  
2 comprises estrogen.

1       **10.**    A compound as recited in Claim 1, wherein said hormone domain  
2 comprises testosterone.

1       **11.**    A compound as recited in Claim 1, wherein said hormone domain  
2 comprises luteinizing hormone.

1       **12.**    A compound as recited in Claim 1, wherein said hormone domain  
2 comprises chorionic gonadotropin.

1       **13.**    A compound as recited in Claim 1, wherein said hormone domain  
2 comprises follicle stimulating hormone.

1       **14.**    A compound as recited in Claim 1, wherein said hormone domain  
2 comprises melanocyte-stimulating hormone.

1       **15.**    A compound as recited in Claim 1, wherein said hormone domain  
2 comprises estradiol.

1       **16.**    A compound as recited in Claim 1, wherein said hormone domain  
2 comprises dopamine.

1           **17.** A compound as recited in Claim 1, wherein said hormone domain  
2 comprises somatostatin.

1           **18.** A compound as recited in Claim 1, wherein said hormone domain, or said  
2 lytic peptide domain, or both comprise D-conformation amino acid residues.

1           **19.** A compound as recited in Claim 18, additionally comprising a carrier  
2 domain to facilitate uptake by the intestine when the compound is administered orally.

1           **20.** A compound as recited in Claim 19, wherein said carrier domain  
2 comprises a vitamin B<sub>12</sub> domain.

1           **21.** A method for producing long-term contraception or sterility in an animal,  
2 comprising administering to the animal an effective amount of: **(a)** a hormone selected  
3 from the group consisting of gonadotropin-releasing hormone, bLH, and l-LHRH-III, and  
4 **(b)** an effective amount of a lytic peptide.

1           **22.** A method as recited in Claim 21, wherein the lytic peptide is administered  
2 after the hormone is administered.

1           **23.** A method as recited in Claim 21, wherein the animal is a mammal.

1           **24.** A method as recited in Claim 21, wherein the animal is a bird.

1           **25.** A method as recited in Claim 24, wherein the bird is a chicken or a turkey.

1           **26.** A method as recited in Claim 21, wherein the animal is an insect.

1           **27.** A method as recited in Claim 26, wherein the hormone and the lytic  
2 peptide are expressed by an exogenous gene in a plant consumed by the insect.

1           **28.** A method as recited in Claim 21, wherein the hormone, or the lytic  
2 peptide, or both comprise D-conformation amino acid residues.

1           **29.** A method as recited in Claim 28, wherein the compound containing  
2 D-conformation amino acid residues additionally comprising a carrier domain to  
3 facilitate uptake by the intestine when the compound is administered orally.

1           **30.** A method as recited in Claim 29, wherein the carrier domain comprises  
2 a vitamin B<sub>12</sub> domain.

1           **31.** A method for producing long-term contraception or sterility in an animal,  
2 comprising administering to the animal an effective amount of a compound comprising  
3 a hormone domain and a lytic peptide domain, wherein said hormone domain is  
4 selected from the group consisting of gonadotropin-releasing hormone, l-LHRH-III, and  
1 bLH.

2           **32.** A method as recited in Claim 31, wherein the hormone domain is bonded  
3 directly to the lytic peptide domain, without an intermediate linking domain joining the  
4 hormone domain to the lytic peptide domain.

1           **33.** A method as recited in Claim 31, wherein the lytic peptide domain is  
2 selected from the group consisting of a cecropin peptide, a melittin peptide, a defensin  
3 peptide, a magainin peptide, a sarcotoxin peptide, and analogs of said peptides.

1           **34.** A method as recited in Claim 31, wherein the lytic peptide domain  
2 comprises hecate.

1           **35.** A method as recited in Claim 31, wherein the compound has the  
2 sequence SEQ. ID NO. 3.

1           **36.** A method as recited in Claim 31, wherein the compound has the  
2 sequence SEQ. ID NO. 4.

1           **37.** A method as recited in Claim 31, wherein the compound has the  
2 sequence SEQ. ID NO. 12 or SEQ. ID NO. 15.

1           **38.** A method as recited in Claim 31, wherein the animal is a mammal.

1           **39.** A method as recited in Claim 31, wherein the animal is a bird.

1           **40.** A method as recited in Claim 39, wherein the bird is a chicken or a turkey.

1           **41.** A method as recited in Claim 31, wherein the animal is an insect.

1           **42.** A method as recited in Claim 41, wherein the peptide is expressed by an  
2 exogenous gene in a plant consumed by the insect.

1           **43.** A method of temporarily restoring fertility in a mammal that had been  
2 made sterile by the selective destruction of gonadotropes in the pituitary, comprising  
3 administering to the mammal an effective amount of gonadotropin-releasing hormone  
4 or I-LHRH-III.

1           **44.** A method as recited in Claim 43, wherein fertility is restored in a mammal  
2 that had previously been made sterile by administering to the animal an effective  
3 amount of: (a) a hormone selected from the group consisting of gonadotropin-releasing  
4 hormone, I-LHRH-III, and bLH, and (b) an effective amount of a lytic peptide.

1           **45.** A method as recited in Claim 43, wherein fertility is restored in a mammal  
2 that had previously been made sterile by administering to the animal an effective  
3 amount of a compound comprising a hormone domain and a lytic peptide domain,  
4 wherein said hormone domain is selected from the group consisting of gonadotropin-  
5 releasing hormone, I-LHRH-III, and bLH.

1           **46.** A plant containing an exogenous gene that encodes a peptide comprising  
2 a hormone domain and a lytic peptide domain, wherein said hormone domain is  
3 selected from the group consisting of gonadotropin-releasing hormone, I-LHRH-III, and  
4 bLH.

1           **47.** A plant containing a first exogenous gene that encodes gonadotropin-  
2 releasing hormone or that encodes I-LHRH or that encodes bLH, and a second  
3 exogenous gene that encodes a lytic peptide.

1           **48.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent or ligand-dependent tumor in a mammal, comprising administering to the  
3 mammal an effective amount of the hormone or ligand on which the growth of the tumor  
4 depends, and an effective amount of a lytic peptide.

1           **49.** A method as recited in Claim 48, wherein the lytic peptide is administered  
2 after the hormone or ligand is administered.

1       **50.** A method as recited in Claim 48, wherein the hormone or ligand and the  
2 lytic peptide are each administered by administering to the mammal a compound in  
3 which the hormone or ligand and the lytic peptide are chemically bonded to one  
4 another.

1       **51.** A method as recited in Claim 48, wherein the cell is part of an ovarian  
2 cancer, and wherein the hormone or ligand comprises estradiol.

1       **52.** A method as recited in Claim 48, wherein the cell is part of a breast  
2 cancer, and wherein the hormone or ligand comprises estradiol.

1       **53.** A method as recited in Claim 48, wherein the cell is part of a prostate  
2 cancer, and wherein the hormone or ligand comprises testosterone.

1       **54.** A method as recited in Claim 48, wherein the cell is part of a  
2 prolactinoma, and wherein the hormone or ligand comprises dopamine.

1       **55.** A method as recited in Claim 48, wherein the cell is part of a growth  
2 hormone-secreting adenoma, and wherein the hormone or ligand comprises growth  
3 hormone.

1       **56.** A method as recited in Claim 48, wherein the cell is part of a thyrotropin-  
2 releasing hormone-secreting adenoma, and wherein the hormone or ligand comprises  
3 thyrotropin-releasing hormone.

1       **57.** A method as recited in Claim 48, wherein the cell is part of a  
2 gonadotropin-secreting adenoma, and wherein the hormone or ligand comprises  
3 gonadotropin.

1       **58.** A method as recited in Claim 48, wherein the cell is part of a growth  
2      hormone-secreting adenoma, and wherein the hormone or ligand comprises  
3      somatostatin.

1       **59.** A method as recited in Claim 48, wherein the cell is part of a pituitary  
2      adenoma, and wherein the hormone or ligand is selected from the group consisting of  
3      gonadotropin-releasing hormone, I-LHRH-III, corticosteroid-releasing hormone, growth  
4      hormone-releasing hormone, vasoactive intestinal polypeptide, and pituitary adenylate  
5      cyclase activating peptide.

1       **60.** A method as recited in Claim 48, wherein the cell is part of a breast  
2      cancer, and wherein the hormone or ligand comprises gonadotropin-releasing hormone  
3      or I-LHRH-III.

1       **61.** A method as recited in Claim 48, wherein the cell is part of an ovarian  
2      cancer, and wherein the hormone or ligand comprises gonadotropin-releasing  
3      hormone, I-LHRH-III, or bLH.

1       **62.** A method as recited in Claim 48, wherein the cell is part of a prostate  
2      cancer, and wherein the hormone or ligand comprises gonadotropin-releasing hormone  
3      or I-LHRH-III.

1       **63.** A method for killing or inhibiting the growth of a cell in a hormone-  
2      dependent tumor in a mammal, comprising administering to the mammal an effective  
3      amount of a compound as recited in Claim 1, wherein the hormone domain of the  
4      compound comprises the hormone on which the tumor is dependent.

1       **64.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 2, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **65.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 3, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **66.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 4, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **67.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 5, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **68.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 6, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **69.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 7, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **70.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 8, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **71.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 9, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **72.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 10, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **73.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 11, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **74.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 12, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **75.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 13, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **76.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 14, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **77.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 15, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **78.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 16, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **79.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 17, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **80.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 18, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **81.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 19, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **82.** A method for killing or inhibiting the growth of a cell in a hormone-  
2 dependent tumor in a mammal, comprising administering to the mammal an effective  
3 amount of a compound as recited in Claim 20, wherein the hormone domain of the  
4 compound comprises the hormone on which the tumor is dependent.

1       **83.** A method for killing or inhibiting the growth of a cell in a mammal, wherein  
2 the activity of the cell is dependent on the binding of a receptor on the cell surface to  
3 a ligand, said method comprising administering to the mammal an effective amount of  
4 the ligand on which the activity of the cell depends, and an effective amount of a lytic  
5 peptide.

1       **84.** A method as recited in Claim 83, wherein the lytic peptide is administered  
2 after the ligand is administered.

1       **85.** A method as recited in Claim 84, wherein the ligand and the lytic peptide  
2 are each administered by administering to the mammal a compound in which the ligand  
3 and the lytic peptide are chemically bonded to one another.

1       **86.** A method as recited in Claim 83, wherein the cell is a lymphocyte  
2 responsible for an autoimmune reaction, and wherein the ligand comprises an epitope  
3 to which the lymphocyte selectively binds.

1           **87.**   A method as recited in Claim 83, wherein the cell is a virally-infected cell  
2   that displays a surface receptor not displayed by otherwise similar, but uninfected cells,  
3   and wherein the ligand selectively binds to the surface receptor.

1           **88.**   A method for inhibiting the reproductive ability of an insect, comprising  
2   administering to the insect an effective amount of a lytic peptide.

1           **89.**   A method as recited in Claim 88, wherein the lytic peptide is selected from  
2   the group consisting of a cecropin peptide, a melittin peptide, a defensin peptide, a  
3   magainin peptide, a sarcotoxin peptide, and analogs of said peptides.

1           **90.**   A method as recited in Claim 88, wherein the lytic peptide comprises L-  
2   hecate.

1           **91.**   A method as recited in Claim 88, wherein the lytic peptide comprises D-  
2   hecate.

1           **92.**   A method as recited in Claim 88, wherein the lytic peptide is expressed  
2   by an exogenous gene in a plant consumed by the insect.

1           **93.**   A method as recited in Claim 92, wherein the lytic peptide expressed by  
2   the plant comprises L-hecate.

1           **94.**   A plant containing an exogenous gene that encodes L-hecate.

1           **95.**   A method as recited in Claim 23, wherein the mammal is a dog.

1           **96.**   A method as recited in Claim 23, wherein the mammal is a cat.

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- 1       **97.**   A method as recited in Claim 23, wherein the mammal is a cow or bull.
- 1       **98.**   A method as recited in Claim 23, wherein the mammal is a pig.
- 1       **99.**   A method as recited in Claim 23, wherein the mammal is a horse.
- 1       **100.**   A method as recited in Claim 23, wherein the mammal is a sheep.
- 1       **101.**   A method as recited in Claim 23, wherein the mammal is a human.
- 1       **102.**   A method as recited in Claim 21, wherein the animal is a mollusc.
- 1       **103.**   A method as recited in Claim 102, wherein the mollusc is a zebra mussel.
- 1       **104.**   A method as recited in Claim 102, wherein the mollusc is an oyster.
- 1       **105.**   A method as recited in Claim 38, wherein the mammal is a dog.
- 1       **106.**   A method as recited in Claim 38, wherein the mammal is a cat.
- 1       **107.**   A method as recited in Claim 38, wherein the mammal is a cow or bull.
- 1       **108.**   A method as recited in Claim 38, wherein the mammal is a pig.
- 1       **109.**   A method as recited in Claim 38, wherein the mammal is a horse.
- 1       **110.**   A method as recited in Claim 38, wherein the mammal is a sheep.

1           **111.** A method as recited in Claim 38, wherein the mammal is a human.

1           **112.** A method as recited in Claim 31, wherein the animal is a mollusc.

1           **113.** A method as recited in Claim 112, wherein the mollusc is a zebra mussel.

1           **114.** A method as recited in Claim 112, wherein the mollusc is an oyster.

1           **115.** A method for selectively killing gonadotrophic cells in the pituitary of an  
2       animal, comprising administering to the animal: **(a)** an effective amount of a hormone  
3       selected from the group consisting of gonadotropin-releasing hormone and I-LHRH-III,  
4       and **(b)** an effective amount of a lytic peptide.

1           **116.** A method for selectively killing gonadotrophic cells in the pituitary of an  
2       animal, comprising administering to the animal an effective amount of a compound  
3       comprising a hormone domain and a lytic peptide domain, wherein said hormone  
4       domain is selected from the group consisting of gonadotropin-releasing hormone and  
1       I-LHRH-III.

1           **117.** A method for selectively killing neurons having gonadotrophic receptors  
2       in an animal, comprising administering to the animal: **(a)** an effective amount of a  
3       hormone selected from the group consisting of gonadotropin-releasing hormone,  
4       I-LHRH-III, and bLH, and **(b)** an effective amount of a lytic peptide.

1           **118.** A method for selectively killing neurons having gonadotrophic receptors  
2   in an animal, comprising administering to the animal an effective amount of a  
3   compound comprising a hormone domain and a lytic peptide domain, wherein said  
4   hormone domain is selected from the group consisting of gonadotropin-releasing  
1   hormone, I-LHRH-III, and bLH.

1           **119.** A method as recited in Claim 21, wherein the animal is sexually immature.

1           **120.** A method as recited in Claim 31, wherein the animal is sexually immature.

1           **121.** A method as recited in Claim 23, wherein the mammal is sexually  
2   immature.

1           **122.** A method as recited in Claim 38, wherein the mammal is sexually  
2   immature.

1           **123.** A method as recited in Claim 48, wherein the cell is part of an ovarian  
2   cancer, and wherein the hormone or ligand comprises I-LHRH-III.

1           **124.** A method as recited in Claim 48, wherein the cell is part of a prostatic  
2   cancer, and wherein the hormone or ligand comprises I-LHRH-III.

1           **125.** A method as recited in Claim 48, wherein the cell is part of a breast  
2   cancer, and wherein the hormone or ligand comprises I-LHRH-III.

1           **126.** A method as recited in Claim 48, wherein the cell is part of an endometrial  
2   cancer, and wherein the hormone or ligand comprises I-LHRH-III.

1           **127.** A compound as recited in Claim 1, wherein said hormone domain  
2           comprises bLH.

1           **128.** A method as recited in Claim 48, wherein the cell is part of a testicular  
2           cancer, and wherein the hormone or ligand comprises gonadotropin-releasing  
3           hormone, l-LHRH-III, or bLH.